Amendments to the Claims:

This listing of claims will replace all prior versions, and listings of claims in the application:

Listing of Claims:

1. (Original) A method of operating a substrate processing chamber, the method comprising:

transferring a first substrate into the substrate processing chamber and heating the substrate to a first temperature of at least 510°C;

depositing an insulating layer over the first substrate while reducing the temperature of the substrate from the first temperature to a second temperature that is lower than the first temperature;

transferring the first substrate out of the substrate processing chamber;

removing unwanted deposition material formed on interior surfaces of the chamber during the depositing step by introducing reactive halogen species into the chamber while increasing the temperature of chamber;

transferring a second substrate into the substrate processing chamber and heating the substrate to the first temperature; and

depositing an insulating layer over the second substrate while reducing the temperature of the substrate from the first temperature to the second temperature.

2. (Original) The method of claim 1 wherein the second temperature is at least 30°C lower than the first temperature.

3. (Original) The method of claim 1 wherein the second temperature is at least 50°C lower than the first temperature.

4. (Original) The method of claim 1 wherein the temperature of the chamber is increased at least 30°C during the removing step.

5. (Original) The method of claim 1 wherein the insulating layer comprises silicon oxide.

6. (Original) The method of claim 1 wherein each depositing step includes first substep of depositing an initial portion of the insulating layer over the first and second substrates, respectively, at the first temperature.

7. (Currently Amended) A method of operating a substrate processing chamber, the method comprising:

transferring a first substrate into the substrate processing chamber and heating the substrate to a first temperature of at least 510°C;

depositing an insulating layer over the first substrate while reducing the temperature of the substrate from the first temperature to a second temperature that is lower than the first temperature;

transferring the first substrate out of the substrate processing chamber;

removing unwanted deposition material formed on interior surfaces of the chamber during the depositing step by introducing reactive halogen species into the chamber while increasing the temperature of chamber;

transferring a second substrate into the substrate processing chamber and heating the substrate to the first temperature; and

depositing an insulating layer over the second substrate while reducing the temperature of the substrate from the first temperature to the second temperature;

~~The method of claim 1~~ wherein the insulating layer deposited during each depositing step is deposited within trenches formed for a shallow trench isolation structure on an integrated circuit.

8. (Original) A method of operating a substrate processing chamber having a substrate heater, the method comprising:

transferring a first substrate into the substrate processing chamber and heating the heater to a first set point that causes the substrate to be heated to a first temperature of at least 510°C;

depositing an insulating layer over the first substrate while reducing the temperature of the heater to a second set point thereby reducing the temperature of the substrate from the first temperature to a second temperature that is lower than the first temperature;

transferring the first substrate out of the substrate processing chamber;

removing unwanted deposition material formed on interior surfaces of the chamber during the depositing step by introducing reactive halogen species into the chamber while increasing the temperature of the heater from a third set point that is lower than the first set point to a fourth set point that is lower than the first set point;

transferring a second substrate into the substrate processing chamber and heating the heater to the first set point substrate to the first temperature; and

depositing an insulating layer over the second substrate while reducing the temperature of the substrate from the first temperature to the second temperature.

9. (Original) The method of claim 1 wherein the second temperature is at least 30°C lower than the first temperature.

10. (Original) The method of claim 1 wherein the second temperature is at least 50°C lower than the first temperature.

11. (Original) The method of claim 1 wherein the temperature of the chamber is increased at least 30°C during the removing step.

12. (Original) The method of claim 1 wherein the insulating layer comprises silicon oxide.

13. (Currently Amended) A method of operating a substrate processing chamber having a substrate heater, the method comprising:

transferring a first substrate into the substrate processing chamber and heating the heater to a first set point that causes the substrate to be heated to a first temperature of at least 510°C;

depositing an insulating layer over the first substrate while reducing the temperature of the heater to a second set point thereby reducing the temperature of the substrate from the first temperature to a second temperature that is lower than the first temperature;

transferring the first substrate out of the substrate processing chamber;

removing unwanted deposition material formed on interior surfaces of the chamber during the depositing step by introducing reactive halogen species into the chamber while increasing the temperature of the heater from a third set point that is lower than the first set point to a fourth set point that is lower than the first set point;

transferring a second substrate into the substrate processing chamber and heating the heater to the first set point substrate to the first temperature; and

depositing an insulating layer over the second substrate while reducing the temperature of the substrate from the first temperature to the second temperature;

~~The method of claim 12~~ wherein the insulating layer ~~is~~ comprises silicon oxide deposited from a process gas comprising ozone and TEOS.

14. (Original) The method of claim 13 wherein the silicon oxide layer is doped with phosphorus.

15. (Currently Amended) A method of operating a substrate processing chamber having a substrate heater, the method comprising:

transferring a first substrate into the substrate processing chamber and heating the heater to a first set point that causes the substrate to be heated to a first temperature of at least 510°C;

depositing an insulating layer over the first substrate while reducing the temperature of the heater to a second set point thereby reducing the temperature of the substrate from the first temperature to a second temperature that is lower than the first temperature;

transferring the first substrate out of the substrate processing chamber;

removing unwanted deposition material formed on interior surfaces of the chamber during the depositing step by introducing reactive halogen species into the chamber while increasing the temperature of the heater from a third set point that is lower than the first set point to a fourth set point that is lower than the first set point;

transferring a second substrate into the substrate processing chamber and heating the heater to the first set point substrate to the first temperature; and

depositing an insulating layer over the second substrate while reducing the temperature of the substrate from the first temperature to the second temperature;

~~The method of claim 8~~ wherein the substrate is heated by a substrate heater embedded in a ceramic pedestal during the removing step.

16. (Original) The method of claim 8 wherein each depositing step includes first substep of depositing an initial portion of the insulating layer over the first and second substrates, respectively, at the first temperature.

17. (Currently Amended) A method of operating a substrate processing chamber having a substrate heater, the method comprising:

transferring a first substrate into the substrate processing chamber and heating the heater to a first set point that causes the substrate to be heated to a first temperature of at least 510°C;

depositing an insulating layer over the first substrate while reducing the temperature of the heater to a second set point thereby reducing the temperature of the substrate from the first temperature to a second temperature that is lower than the first temperature;

transferring the first substrate out of the substrate processing chamber;

removing unwanted deposition material formed on interior surfaces of the chamber during the depositing step by introducing reactive halogen species into the chamber while increasing the temperature of the heater from a third set point that is lower than the first set point to a fourth set point that is lower than the first set point;

transferring a second substrate into the substrate processing chamber and heating the heater to the first set point substrate to the first temperature; and

depositing an insulating layer over the second substrate while reducing the temperature of the substrate from the first temperature to the second temperature;

~~The method of claim 8~~ wherein the insulating layer deposited during each depositing step is deposited within trenches formed for a shallow trench isolation structure on an integrated circuit.

18. (Original) A method of operating a substrate processing chamber of the type used to fabricate integrated circuits, the method comprising:

transferring a first substrate into the substrate processing chamber;

depositing a silicon oxide film over the first substrate by introducing TEOS and ozone gases into the chamber and maintaining the chamber at a pressure of between about 45 to 700 Torr, wherein the depositing step includes forming a first portion of the silicon oxide film while heating the substrate to a temperature of at least 510°C using a substrate heater and forming a second portion of the silicon oxide film over the first portion while reducing the temperature of the substrate;

transferring the substrate out of the chamber;

thereafter, removing unwanted deposition material from interior surfaces of the chamber by introducing a fluorine-containing etchant gas into the chamber;

during the removing step, ramping up the temperature of the substrate heater to increase the chamber temperature;

transferring a second substrate into the substrate processing chamber; and

depositing a silicon oxide film over the second substrate disposed by introducing TEOS and ozone gases into the chamber and maintaining the chamber at a pressure of between about 45 to 700 Torr, wherein the depositing step includes forming a first portion of the silicon oxide film while heating the substrate to a temperature of at least 510°C using a substrate heater and forming a second portion of the silicon oxide film over the first portion while reducing the temperature of the substrate.

19. (Original) The method of claim 18 wherein the second temperature is at least 30°C lower than the first temperature.

20. (Original) The method of claim 18 wherein the second temperature is at least 50°C lower than the first temperature.

21. (Original) The method of claim 19 wherein the temperature of the chamber is increased at least 30°C during the removing step.

22 (Original) The method of claim 21 wherein during each depositing step the deposited silicon oxide layer is doped with phosphorus.

23. (Original) The method of claim 21 wherein the substrate is heated by a substrate heater embedded in a ceramic pedestal during the removing step.

24. (Original) The method of claim 21 wherein the silicon oxide layer deposited during each depositing step is deposited within trenches formed for a shallow trench isolation structure on an integrated circuit.

25. (New) A method of operating a substrate processing chamber having at least interior surface comprising one aluminum, aluminum oxide or aluminum nitride, the method comprising:

transferring a first substrate into the substrate processing chamber;

depositing a dielectric layer over the first substrate using a high temperature chemical vapor deposition in which the substrate reaches a peak temperature of at least 510°C

and at the conclusion of the depositing step the temperature of the substrate is reduced from the peak temperature to a second temperature that is at least 30°C lower than the peak temperature, wherein the depositing step results in unwanted dielectric material being deposited on the least one interior surface of the chamber;

transferring the first substrate out of the substrate processing chamber;

thereafter, removing the unwanted deposition material formed on the at least one interior surface of the chamber during the depositing step by introducing reactive fluorine species into the chamber;

thereafter, transferring a second substrate into the substrate processing chamber; and

depositing a dielectric layer over the second substrate using a high temperature chemical vapor deposition in which the substrate reaches a peak temperature of at least 510°C and at the conclusion of the depositing step the temperature of the substrate is reduced from the peak temperature to a second temperature that is at least 30°C lower than the peak temperature.

26. (New) The method of claim 25 wherein the temperature of chamber is increased during the step of removing the unwanted deposition material formed on the at least one interior surface of the chamber.

27. (New) The method of claim 25 wherein during each of the steps of depositing a dielectric layer the temperature of the substrate reaches a peak temperature of at least 540°C and the temperature of the substrate at the conclusion of the depositing step is reduced from the peak temperature to a second temperature that is at least 50°C lower than the peak temperature.

28. (New) The method of claim 27 wherein the dielectric layer deposited over the first and second substrates comprises a silicon oxide material.

29. (New) The method of claim 1 wherein the substrate processing chamber includes at least one component comprising aluminum, aluminum oxide or aluminum nitride that has a surface upon which unwanted deposition material is formed during each of the depositing steps.

30. (New) The method of claim 8 wherein the substrate processing chamber includes at least one component comprising aluminum, aluminum oxide or aluminum nitride that has a surface upon which unwanted deposition material is formed during each of the depositing steps.

31. (New) The method of claim 18 wherein the substrate processing chamber includes at least one component comprising aluminum, aluminum oxide or aluminum nitride that has a surface upon which unwanted deposition material is formed during each of the depositing steps.